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PCT/FR03/01661

CLAIMS

1. A device for producing a plasma (16) in a
5 chamber comprising means for producing an
energy in the microwave spectrum for the
excitation of the plasma, said means comprising
at least one basic plasma excitation device
10 comprising a coaxial applicator (4) of
microwave energy, of which one end is connected
to a production source (7) of microwave energy,
the other end (8) being directed to the gas to
be excited within the chamber, characterized in
15 that each basic excitation device is arranged
in the wall (3) of the chamber, each applicator
(4) comprising a central core (5) which is
substantially flush with the wall of the
chamber, the central core and the thickness of
20 the wall (3) of the chamber being separated by
a space (6) coaxial with the central core, this
space being completely filled at least at one
end of each applicator with a dielectric
material (14) such that said material is
25 substantially flush with the level of the wall
of the chamber.
2. The device as claimed in claim 1, characterized
in that the dielectric material (14) is
30 refractory.
3. The device as claimed in claim 2, characterized
in that the dielectric material (14) is made of
an alloy of silica and/or of aluminum nitride
and/or of alumina.
- 35 4. The device as claimed in one of claims 1 to 3,
characterized in that the dielectric material
fills the entire coaxial space (6).

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- 5 5. The device as claimed in one of claims 1 to 3,
characterized in that the length of the
dielectric material is equal to an integral
number of half-wavelength of the microwaves in
the dielectric material.
- 10 6. The device as claimed in one of claims 1 to 5,
characterized in that it comprises O-rings (21)
inserted between the dielectric (14), the
central core of an applicator and the internal
wall of the applicator.
- 15 7. The device as claimed in claim 6, characterized
in that each O-ring (21) is embedded in the
internal and external walls of the coaxial
structure.
- 20 8. The device as claimed in one of claims 1 to 7,
characterized in that a central core (5)
terminates in a permanent magnet (22)
encapsulated in the central core and flush with
the walls of the chamber.
- 25 9. The device as claimed in one of claims 1 to 8,
characterized in that it comprises a dielectric
plate (20) that extends to the interior of the
chamber on the internal wall thereof, said
plate completely covering the plasma excitation
devices.
- 30 10. The device as claimed in one of claims 1 to 9,
characterized in that it comprises means (12)
for cooling each applicator (4) in the chamber
walls.
- 35 11. The device as claimed in one of claims 1 to 10,
characterized in that it comprises means for
cooling the applicators in the central core (5)
of each applicator (4).

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12. The device as claimed in one of the preceding claims, characterized in that the pressure of the plasma (16) is between a value of about
5 1 millitorr and a value of about a few tens of torr.
13. The device as claimed in one of the preceding claims, characterized in that it comprises a
10 plurality of applicators (4), the applicators being arranged in a two-dimensional network in the wall of the chamber in order to obtain the desired applicator density for a desired pressure range.